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MAY 20, 1950

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

Frog's Eye View

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PHYSICS

From Now On: Radiation

H-bomb radiation might poison atmosphere and effect harmful changes in future generations. The danger of atomic war must be minimized.

By WATSON DAVIS

Eighth in a series of glances forward in science.

➤ RADIATION may bring the downfall of the human race. If the deadly blast of neutrons, gamma radiation, and other debris from explosions of A (fission) or H (light-element) atomic bombs do not wipe out large portions of the world's population, they may so insidiously poison the atmosphere that everyone may be endangered.

This is not a cheerful prospect, but it is one that must be considered.

When X-rays were first discovered in the last decade of the last century, some of the physicians who used them to view broken bones did not realize the danger from them. They exposed themselves to the X-radiation so much that before the danger from X-ray burns was realized they had suffered damage. Sometimes the damage did not appear until years later when some of these good doctors developed skin cancers which resulted in loss of fingers, hands or sometimes death.

Today there is great care taken in use of X-rays, and even concern about the long-time effects of such devices as the simple X-ray machines that are sometimes used in fitting children's shoes.

Aside from the effect upon the person who is irradiated, there is the possible change in the germ plasm that may be handed down to future generations. Dr. H. J. Mueller won a Nobel prize for his discovery of the mutations (changes in the hereditary qualities of the germ cells) caused by X-rays in fruit flies. A prime concern over the effect of the atom bomb in Japan has been what changes in human characteristics may show up in the next few generations of the descendants of the survivors of those blasts.

There is one source of radiation that we can do little about. Cosmic radiation from outer space rains upon all of us, with a particle shooting through our bodies every few seconds. This has been suggested as a possible cause of changes in human heredity, over long periods of time. They may even cause cancer or have something to do with it, although this is highly speculative.

There is possibility of control of radiation that is being introduced into our daily civilized life from a variety of sources. Great care to reduce radiation danger is taken at atomic energy research laboratories. The radioactive isotopes for research and medical use are dealt out with a realization of their danger. With a world at peace, the radiation danger can probably be kept under control, although there are some scientists who are very apprehensive about a rising world contamination with remote but dangerous effects.

All the radiations, whether from X-ray tubes, radium, other radioactive elements, or atomic bombs (fission or H-type) have the same possibility of changing the future course of heredity in living things, animal or vegetable.

If atomic war comes, the dangers will be multiplied greatly. The atmosphere might be filled with radioactive dust which everyone would have to breathe. Radioactive clouds might be used as a weapon to add to the debris of the bombs themselves.

To combat the radiation menace, we should:

A. Minimize the danger of atomic war in all possible ways (which is easier said than done).

B. Recognize the dangers to ourselves and future generations from exposure to radiation, although in peacetime the medical, health and industrial authorities can be relied upon to give us this protection generally.

C. Continue research upon the radiation problem, both through experimentation with animals and plants whose generations are swifter than ours, and through study of human population exposures.

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ENGINEERING

Petroleum in 2000 A.D.

➤ PETROLEUM in the year 2000 A.D. will still be a major fuel and chemical raw material, despite gloomy predictions of early exhaustion, Dr. Gustav Egloff of the Universal Oil Products Co., Chicago, told the American Institute of Chemists in New York.

Refining of 16,000,000 barrels of petroleum daily 50 years hence is foreseen, compared with 6,000,000 barrels daily now. Natural gas production in 2000 A.D. will be 21,000 billion cubic feet per year, compared with the present 6,000 billion cubic feet.

Only one percent of this immense predicted production will be needed for making chemicals from petroleum, Dr. Egloff explained. Oil and natural gas are even replacing coal as the raw material for organic chemicals so important to modern life. Fifty years ago practically no chemicals were made from petroleum. The chief petroleum product was kerosene in 1900. The petrochemical industry began in the early 1920's, with about 12,000,000,000 pounds produced from petroleum and natural gas this year. Dr. Egloff's estimate for 2000 A.D. is 48,000,000,000 pounds.

Fifty years from now practically all of our ethyl alcohol will be synthetic, Dr. Egloff believes, because grains and other foods will be needed to feed the increased population. Synthetic glycerin will dominate the market in the year 2000.

Chemical insecticides, weed-killers and other new products, based on oil, will be developed at a tremendously increasing rate for improving agricultural operations, Dr. Egloff predicted.

Synthetic rubbers, made from oil and gas, will total 2,000,000 tons in 50 years, quintupling the present output.

Most of our clothing in the next half-century will be made basically from petroleum, with synthetic fibers steadily replacing cotton and wool.

Soapless soaps, now a billion pounds production annually, will reach five times that in the next five decades.

More of the aromatics, such as benzene, toluene and xylenes, now obtained from coal carbonization, will come from petroleum.

Dr. Egloff predicted that the next 50 years would see the commercialization of 13,500 new chemicals.

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MEDICINE

"Factory Thumb" Replaces "Washerwoman's Sprain"

➤ "WASHERWOMAN'S sprain," a painful and disabling condition of the wrist, has become "factory thumb." Washing machines do women's traditional work and women do factory work such as putting tight fitting rubber rings over pipes.

One result is that the tendons of certain thumb muscles are sprained from pressure in certain jobs. The sheath of the tendon becomes inflamed and the pain extends into the wrist and up the arm. Then the hand grows weak and the patient continually drops even small objects.

Surgical treatment brings 100% cures, and no other treatment helps much, Dr. Leo Frederick Miller of Chicago has found, and reported to the American Association of Industrial Physicians and Surgeons.

The operation is simple, done under local anesthetic, the thumb may be moved in two days and can be used fully in two weeks.

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MEDICINE

Radiation of Deep Cancers

A new way of using radioactive cobalt will make pin-point radiation of deep cancer possible. The beam will be more penetrating than that of X-rays.

➤ PIN-POINTED radiation of deep-seated cancers will be possible with a new way of using radioactive cobalt being worked out in a joint project between the Oak Ridge Institute of Nuclear Studies and the University of Texas' M. D. Anderson Hospital at Houston.

The cobalt, after being made radioactive in the uranium chain-reacting pile or reactor, will be incorporated in a unit comparable to an X-ray machine operating in the one- to two-million volt range.

The radiocobalt irradiator, as the new cancer treatment instrument is called, will consist of a spherical shield of some heavy metal such as lead with the radioactive cobalt enclosed in the middle. The shield will be about a foot in diameter and will have a slit in it through which the radiation from the radiocobalt will pass. With this a small but very intense beam of gamma rays can be directed to the cancer.

The new irradiator is expected to have the advantage over X-rays of a more localized and more penetrating beam permitting pin-point irradiation of the cancer. Radiocobalt has the advantage over radium of being cheaper and easier to handle and, a further advantage, it can be made to have any desired amount of radioactivity.

Radiocobalt has already been used in treatment of cancer patients, but in these earlier trials it was used in the form of needles, much like the radium needles used for cancer treatment.

The radiocobalt irradiator will be thoroughly tested on animals before being used on human cancer patients. When the scientists are satisfied from the animal work about the results obtainable, the Oak Ridge Institute and the M. D. Anderson Hospital will request permission from the Atomic Energy Commission to use it on cancer patients. These will be selected initially by the 22 Southern medical schools participating in the Institute's medical research program. The facilities will not be open to the general public.

The M. D. Anderson Hospital will design and fabricate the irradiator, while the Oak Ridge Institute will supply the facilities of its new Cancer Research Hospital. And the AEC plans to build a Telecobalt Therapy Building, to be about 650 square feet in size, to house the unit. Invitations have been issued to contractors to bid on this until May 22, after which they will be publicly opened.

The new irradiator will be built to contain over 1,000 curies of radiocobalt. Because of the special requirement that the unit have the 1,000 curies in a small volume of cobalt metal, it may be necessary to obtain the final material from the higher flux reactor at Chalk River, Canada.

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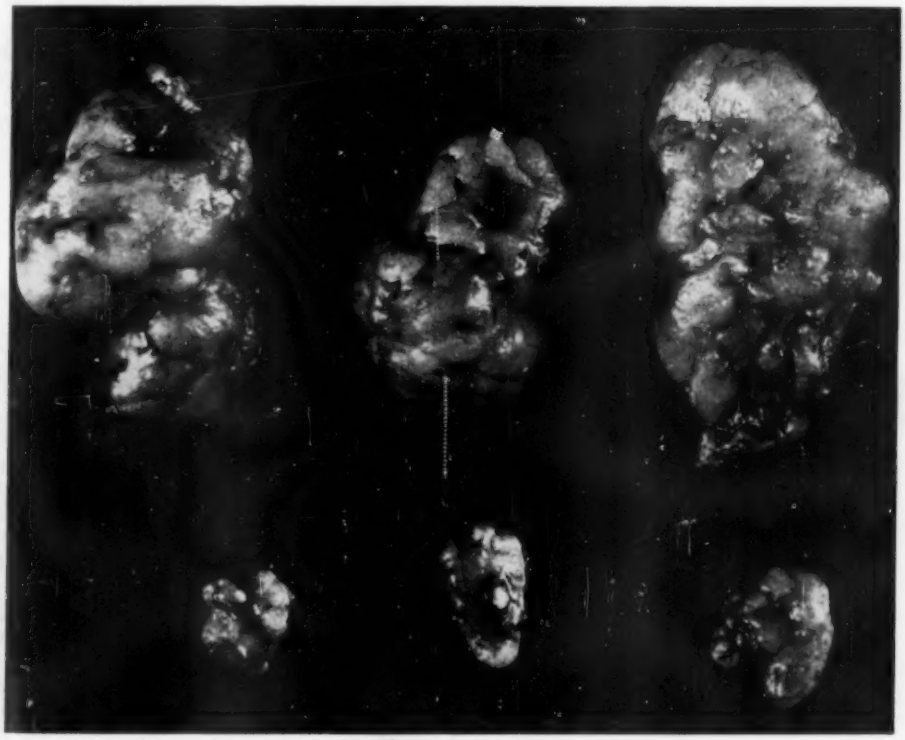

WHICH ONE HAD THE GUANAZOLO?—The above pictures illustrate the effectiveness of guanazolo in slowing down the growth of certain types of cancers in mice. The tumors above were not treated with the new chemical; those below received treatment with guanazolo.

MEDICINE

New Chemical Slows Down Cancer Growth

➤ SLOW-DOWN of the growth of certain types of cancer in laboratory mice through the use of a new chemical compound has been "striking," a Columbia University team reported to the American Cancer Society.

The compound, guanazolo, effectively retarded the growth of breast cancers in mice without causing any toxic side reactions. Although it slows down the growth of the cancer, the chemical never caused the cancer to grow smaller, the doctors report.

Guanazolo is able to distinguish a biochemical difference between normal tissues and certain cancers. Thus this and allied compounds may be very useful in exploring the biology of cancer and may "indicate chemical weapons which will specifically inhibit cancer in man," the researchers conclude.

Members of the research team at Columbia are Drs. Alfred Gellhorn, Morris Engleman, Daniel Shapiro, Samuel Graff and Horace Gillespie.

Dr. G. W. Kidder of Amherst College, Amherst, Mass., and other researchers had previously noted that guanazolo had a slowing effect on certain mouse tumors.

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METEOROLOGY

Less Rain and Snow Is Only Temporary

➤ WE are having less rain and snow, but this is only a temporary situation.

A detailed study of rainfall records for this country over the last 100 years led to this conclusion. From these records it is clear that there are no continuous upward or downward trends in rainfall, Drs. Joseph V. B. Wells and Conrad D. Bue of the U.S. Geological Survey told a joint session of the American Geophysical Union and the American Meteorological Society in Washington.

Our streams are reliable sources of surface water. Even if the rainfall has been declining, they would furnish adequate water if we used them properly, they stated.

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MEDICINE

Rays Kill TB Germs

➤ THE sun's rays, long believed to have healing powers in tuberculosis, promise now to give science a new, potent weapon against the white plague.

The weapon is a vaccine. Unlike BCG, the most generally used vaccine against tuberculosis, this new one is made from dead TB germs. The germs, from a highly virulent strain in the lungs of a tuberculosis patient, are killed by man-made ultraviolet rays, like those produced by the sun.

Tried on guinea pigs, this vaccine gave at least as good protection against tuberculosis as the BCG vaccine made of living, weakened TB germs. Over half the animals vaccinated showed minimal or no gross sign of tuberculosis when "challenged" after vaccination by injections of virulent tuberculosis germs. This is a "significant difference" from the extent of the disease in non-vaccinated animals "challenged" by the same dose of virulent germs.

Preparation of this new vaccine and its trials in guinea pigs were reported to the National Tuberculosis Association meeting by Dr. Fred Stimpert and R. W. Sarber, research bacteriologists, of Parke, Davis and Company, Detroit, and Dr. W. J. Nungester of the University of Michigan.

One of the big objections to use of BCG vaccine is that it is made of live, though greatly weakened, tuberculosis germs. Many physicians have feared that these live germs might grow more virulent and cause disease instead of protecting against it. Another disadvantage of BCG is that it is unstable and cannot be relied on to be effective for more than a few days after its preparation.

The new vaccine from ultraviolet-killed germs remains effective for months, at least, and perhaps longer though long-term stability tests have not yet been finished.

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PHYSICS

Virus, Gene Secrets Nearer

➤ THE SECRETS of virus growth, the duplication of genes, and thus of life itself seems now to be nearer as a result of studies reported by Dr. Herbert Jehle of the University of Nebraska to the American Physical Society.

With its parts vibrating in unison—like a gigantic symphony orchestra—the macromolecules which are the genes or viruses can electrically signal to each other and attract without being in contact. Two identical molecules will tend to resonate while being buffeted by thermal forces.

The identical electric vibrations generated will then push the large chemical units into precise alignment, and will attract them to each other. If the molecules differ, even in the position of a single atom, the strong forces will be lost. This physical process may explain gene self-duplication, anti-body formation, and some of the other little understood chemical life processes.

The particular aspect of this theory described by Dr. Jehle at the meeting of the American Physical Society was the exact quantum-mechanical operation of the interaction. Dr. Jehle pointed out that previous studies had been based upon the so-called classical approach, which cannot always be trusted to give correct answers in atomic behavior.

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Question Box

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Photographs: Cover, Chicago Natural History Museum; p. 307, Columbia University; p. 309, Westinghouse; p. 311, Aeronautical Photographic Experimental Laboratory, U. S. Navy; p. 315, Eugene Hutchinson.

● RADIO

Saturday, May 27, 3:15-3:30 p. m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Maurice L. Tainter, Director, Sterling-Winthrop Research Institute, will speak on "New Drugs for Medicine."

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MINING

USSR Leads Prospecting

The Russians are 14 years ahead of U. S. in chemical prospecting. Progress in this country has been made since 1946, particularly in tracking down deposits of zinc.

➤ THE U. S. Geological Survey is quietly distributing to American mining companies, and to any one else who wants one, a 103-page blue-covered document. The booklet is virtually the only evidence available that Russian scientists may be out ahead of the world in developing new chemical techniques of prospecting for metals vital to modern warfare.

Title of the publication is SELECTED RUSSIAN PAPERS ON GEOCHEMICAL PROSPECTING FOR ORES. Translated by two top U. S. geochemists, Herbert E. Hawkes of the Geological Survey and Dr. V. P. Sokoloff of Johns Hopkins University, the six articles it contains are dated from 1939 to 1946.

They reveal that since 1932 the Russians have carried on systematic investigations of soil, groundwater and plant life as a way of locating buried deposits of such minerals as tin, lead, zinc, copper, molybdenum, chromium, nickel and tungsten.

Mr. Hawkes, chief of the Geological Survey's geochemical prospecting division, said the Russians were 14 years ahead of scientists in this country. It was not until 1946 that the first large-scale work along these lines was begun by the U. S. Government.

Translation of the six Russian articles was done more than a year ago, and two copies were placed in the Survey's files. A brief notice was sent out to mining journals that the Russian data could be inspected by any one interested.

In the next two months, 75 requests came in from American mining engineers and prospectors. The demand for photostats was so great that this spring the Survey decided to reproduce the translations for general distribution.

The report shows that Russia achieved great success in its first experiments in tracking down underground metals by their chemical traces on the surface.

The Soviet scientists found that an underground mineral sometimes formed a "dispersion halo" or "dispersion train" of metallic decomposition products which could be followed much as a bloodhound follows a trail by scent.

Quick, fool-proof chemical tests were developed which could be used in the field. Thus was eliminated the need for sending countless rock and soil samples back to a laboratory for complicated assay tests.

One of the articles describes a "luminoscope," a gadget for locating tiny amounts of rare metals in the soil by ultraviolet light. Other papers give comprehensive summaries of Russian progress up to World War II in soil and water analysis. Equipment for a portable field laboratory is even listed, down to "one tablespoon, aluminum."

Four of the articles were written by E. A. Sergeev, senior scientific associate of the Soviet Union Geological Institute. Other authors are A. P. Solovov, E. A. Ratsbaum, N. I. Tikhomirov and S. D. Miller.

After 1946, only a few brief items about geochemical prospecting appeared in scientific journals coming out of Russia, the Geological Survey experts found. Since 1948, the prospecting journals themselves have stopped coming. The Iron Curtain slammed down, shutting off all information on further Russian research in the geochemical field.

In the U. S., government and private geologists alike have been racing to catch up. But Russia, the articles reveal, has many more large-scale field projects to its credit than have yet been tried in this country. Already notable progress has been made, particularly in tracking down new deposits of zinc.

Some 15 private U. S. companies are known to be carrying on private research in geochemical prospecting. But under traditional American competition, whatever has been learned has become closely-guarded trade secrets.

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ASTRONOMY

Less Glow on Spring Nights

➤ HOW dark the night, you say. You may be right. Discounting any light from the moon and stars, the sky in the spring seems to be darker than during the cold nights of midwinter, the American Geophysical Union was told in Washington.

A new instrument developed by the Naval Research Laboratory is being used from Alaska to Greenland to measure the brightness of night sky. With it, scientists hope to learn more about the soft night glow which comes from the upper layers of the atmosphere even on moonless nights.

One finding, Prof. Carl A. Pearson and M. J. Koomen reported at the geophysical convention, was that the Maryland sky on nights near the end of March has less glow than in December and January. They said the data seemed to show there is seasonal fluctuation in the darkness of the night.

The researchers are not sure yet whether it is lighter at night the farther north you go. Observations at the University of Alaska's Geophysical Institute showed more night glow than that found in Maryland, John B. Wilcox of the university said. Although the readings were taken when the Northern Lights were not active, the higher overall glow was ascribed to the polar aurora borealis.

Other scientists, reporting on parts of the study were Dr. Edward O. Hulburt, Dr. Richard Tousey and L. Dunkelman of the Naval laboratory and Dr. B. W. Currie of the University of Saskatchewan, Canada.

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ENGINEERING

Mica and Resin Base of Insulation

➤ MICA flakes and a synthetic resin are the base of a new insulation material which makes possible the construction of bigger generators to supply increasing demands for electricity.

A development of Westinghouse Electric Corporation, it is known as Thermalastic because of its high heat resistance and its ability to expand and contract with the generator coils on which it is used.

The new insulation, also tough and resistant to chemicals, will last at least ten times as long as previous insulations under conditions of severe electrical stress, according to Graham Lee Moses of the Westinghouse staff. Mica flakes are already in use in earlier insulation materials but they are bonded with either shellac or asphalt. They do not meet the conditions now encountered in giant electric generators being constructed.

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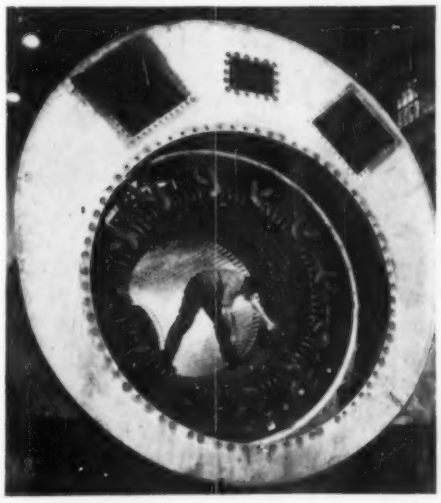

***WHALE OF A GENERATOR—** Largest generator equipped with Thermalastic insulation is this 100,000 kilowatt "whale" which seems to be in the act of swallowing the Jonah who is checking the Thermalastic-impregnated coils in the generator's stationary outer frame.*

GENERAL SCIENCE

Top Minds at Work

Many of the scientists who worked on the atomic bomb during the war are thought to now be working on the H-bomb. The breath of the Manhattan project is in the air.

➤ MOST of the scientists who could make the super H-bomb, if it can be made, were not working on it a few months ago. It was generally agreed that only one of the top mathematical physicists, needed to plan and execute the research on paper and in the laboratory, was actually engaged in this task before President Truman announced that the United States was working on the new bomb.

Now it seems certain that many of the physicists and mathematicians, veterans of the A-bomb research, are quietly back at work on the atomic energy program. They are probably working on the hydrogen bomb project. Many of them in the years since the war continued to be consultants on various phases of the atomic energy program, but most of them were engaged in the phases of the program that were not related directly to present or eventual weapons.

While he has not appeared at any scientific meetings, it is known that the world-famous pioneer in physics, Dr. Neils Bohr of Denmark, was in the United States for some weeks, visiting at the Institute for Advanced Study at Princeton, N. J., which is directed by Dr. J. Robert Oppenheimer, war-time head of the Los Alamos atomic bomb laboratory.

Another Princeton scientist, Dr. Eugene Wigner, has been a very active consultant to the Atomic Energy Commission. Dr. Hans Bethe of Cornell, who worked out the famous mechanism by which the sun is believed to replenish its power by conversion of mass into energy, is also more active in AEC work than he has been in the past. Dr. John A. Wheeler of Princeton has returned from a prolonged visit to France.

Work on the hydrogen bomb, particularly the theoretical considerations that are so important, would not need to be done at one of the Atomic Energy Commission's installations, but could be done by groups of top scientific minds assembled at almost any convenient place.

The temper of many top atomic scientists, particularly before it was certain that the Soviets achieved an atomic explosion last fall, was such that they were not inclined to work on the hydrogen bomb. The course of events seems to have changed their feelings in recent weeks. There is more of the atmosphere of the old Manhattan project of war-time abroad in the land.

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MEDICINE

Report on Antihistaminics

➤ A CONTROLLED study of antihistaminic drugs for treating colds showed these to be no more effective than pills and nasal spray without antihistaminics, Lt. Col. R. J. Hoagland, chief of medical service at the station hospital, U.S. Military Academy, West Point, N.Y., reports in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (May 13).

Cures of head colds within 24 hours were reported by 16% of patients given antihistaminic drugs by mouth. But cures within 24 hours were also reported by 27% of patients given the pills or nasal spray looking like the antihistaminic ones but actually not containing any antihistaminic.

"Furthermore, essentially the same proportion of patients reported no benefit from either type of treatment," Col. Hoagland and associates, Capt. E. N. Deitz, Lt. P. W. Myers and Lt. H. C. Cosand, report.

The antihistaminics tried in this study were tripelennamine hydrochloride, also known as pyribenzamine hydrochloride, and chlorothen citrate, known also as tagathen.

Pyribenzamine given by nebulizer, or very fine spray, into the nose had about the same effect as the inert, non-antihistaminic spray.

Use of the antihistaminic drugs either in pills or in spray may decrease the irritating nasal discharge of the early stage of a cold, but, say the Army doctors, "the brief and variable duration of this phase makes a positive conclusion regarding this point difficult."

About one-third of the patients with colds are likely to recover spontaneously within 24 hours, a point which must be borne in mind in any study of a drug for colds, the doctors point out.

Even the season of the year in which remedies for colds are tested may affect the results, they suggest, recalling the finding of another scientist that colds tend to become severer as the winter progresses and that by May all medicines used resulted in decreased reports of definite improvement.

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MEDICINE

Microscope Needed to See Points of Nerve-Needles

➤ NEEDLES for exploration of human nerves, with points so sharp they must be examined under a microscope, are being turned out by three doctors at Columbia University's College of Physicians and Surgeons.

The needles are really electrodes for recording or stimulating the tiny electrical impulses in the nervous system. Such wires must be extremely sharp to prevent damage to the nerve tissue. Up to now they were laborious and costly to make by special grinding techniques.

Drs. Harry Grundfest, Robert W. Sengstaken and Walter H. Oettinger of Columbia, and a U. S. Steel Corporation scientist, R. W. Gurry, use an electric current in an acid bath to point the needles. Their new method produces stainless steel needles with tips that are much finer than any hair: less than one one-hundred-thousandth of an inch in diameter.

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PSYCHIATRY

Society for Psychopaths Is Announced

➤ A MOTHER whose first child has been diagnosed as a "constitutional psychopath" told the American Psychiatric Association that a new Foundation has been created to aid children, teen-agers and grown-ups with this same disorder.

The Foundation for the Study and Aid of the Emotionally Unstable Personality is the name of this organization. The mother who told about it, Mrs. D. Perry Blount of Plainfield, N.J., is its president.

Constitutional psychopaths are neither mentally retarded nor insane, she pointed out. But they are so emotionally unstable that they cannot adjust at home, school, work or in the community. Their antisocial behavior fluctuates from petty annoyances to major crimes.

Information from mental hospitals, clinics, reform schools and prisons shows there are "an almost unbelievable number" of these psychopaths.

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On This Week's Cover

➤ USURPING the position of the bird for a unique perspective angle, the "Frog's Eye View" by Clifford Matteson, of Buffalo, N. Y., was winner of a ribbon in the 5th Chicago International Nature Photography Exhibition.

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GENERAL SCIENCE

Finalists in Citizen Role

The thirty finalists in the first National Science Fair possess a basic requirement of good citizenship, that of scientific knowledge, according to Dr. Compton of M. I. T.

➤ THIRTY teen-age scientists have demonstrated their skill as experimenters and student technicians in exhibits brought to Philadelphia May, 19, 20 and 21, for the first National Science Fair ever to be held in the U. S.

They have already taken a long step toward an increasingly important requirement of citizenship—that of scientific knowledge and understanding—as noted by Dr. Karl T. Compton, president emeritus of the Massachusetts Institute of Technology.

Dr. Compton, speaking at the closing ceremonies of the Massachusetts Science Fair on April 30, outlined four fields of work open to the high-school boys and girls who competed in local and regional fairs across the country in April and May to try out for the National Science Fair.

"You have a creative interest in science," he said. "Now what lies ahead."

"First, you can teach science. There are never enough good science teachers. Or you can go into the field of pure research—the field for those who study scientific phenomena for sheer interest.

"Perhaps you will go into applied research. That is a big field now. I remember when there were no more than 100 such laboratories in the country. Now there are 25,000, employing 150,000 workers.

"Or you may enter the field of education of the general public in science. It is most important," he emphasized, "that the public have an understanding of science, what it is, how it may be used, for today the frontiers of science are being pushed farther and farther back.

"Not every one is a scientist. Perhaps some of you who have exhibits here today will not find a future in science.

"But every one will be a citizen—and good citizens should have a knowledge of science."

The fair was held in Philadelphia's famed Franklin Institute. Complicated exhibits, working models and demonstrations in scientific fields from nuclear physics to plant pathology—all built by youngsters in their last three years in high schools across the country—were exhibited to the public.

Finalists at the fair were the top winners in local and regional science fairs held in the past six weeks from Boston to Oklahoma City. They were sent to Philadelphia as guests of their local newspapers, which are sponsoring the fair in cooperation with Science Clubs of America, administered by Science Service.

A panel of scientists, educators and industrialists in the Philadelphia area judged the exhibits. To the top 12 contestants were awarded $1,000 in scientific equipment of their own choice.

Science News Letter, May 20, 1950

MEDICINE

Peak of Veteran TB Cases Expected in 1955

➤ A PEAK of 20,000 veterans suffering from tuberculosis and in need of hospitalization will be reached in 1955, Dr. Paul B. Magnuson, chief medical director of the Veterans Administration, predicts.

As of Feb. 28 this year there were 13,065 veterans with TB in VA hospitals, 2,109 in non-VA hospitals and 2,379 on the waiting list.

After 1955 Dr. Magnuson expects the number to decline gradually until 1960 and then to level off with a fairly steady load of between 15,000 and 18,000 patients constantly in hospitals. The figures are estimates, he pointed out, and may need to be revised later.

A report from the VA Claims Service shows that the percentage of World War I veterans on the compensation rolls for service-connected tuberculosis is seven times greater than the percentage of World War II veterans.

Science News Letter, May 20, 1950

AGRICULTURE

Deep Freeze Keeps Pollen For Next Year's Apples

➤ LAST year's apple pollen, kept in deep freeze all winter, was used to "father" California apples this spring as the apple trees blossomed.

Specialists of the U.S. Department of Agriculture believe the tests may show long-term storage of apple pollen by freezing to be possible. Unlike some plant pollens, that of the apple tree loses its power to germinate when dried and kept in ordinary cold storage.

To collect the pollen, Federal entomologists robbed bees working in apple orchards. They set traps of coarse mesh screen at the entrance to the hives. Bees returning with a load of pollen brushed through the screen, and part of their cargo dropped off into cups beneath the traps. It was promptly packed in dry ice by the scientists.

Preliminary tests through the winter showed the pollen would still germinate when thawed out. The real test was its application to 1950 blossoms in the orchard.

Storage by freezing, if it works, could be very valuable to apple growers. It would help in crossing late season apple varieties with types which bloom early the following spring.

Science News Letter, May 20, 1950

METALLURGY

Cesium Is Most Compressible Substance

➤ THE world's most compressible substance at very high pressures is the rare metal, cesium. Dr. P. W. Bridgman, Harvard physicist, told the Royal Society in a lecture in London that he has been able to compress this metal to only three-eighths of its original volume at the immense pressure of 100,000 kilograms per square centimeter (34,000 pounds per square inch). The experiments were made at Harvard University in Cambridge, Mass.

Science News Letter, May 20, 1950

NUTRITION

New Diet Ordered For WACS and WAFS

➤ THE standard 3,600-calorie-per-day ration of the Army and Air Force is too fattening for the WACs and WAFs. They gain weight so fast on this ration they often have to have larger uniforms issued shortly after enlistment. And the weight gain cuts down on their physical fitness. So a 2,400-calorie ration has been ordered for them with plenty of vitamins and protein.

Science News Letter, May 20, 1950

GOING UP—The pilot ejection tower was one of the highlights in the visit of the National Science Fair finalists on a tour of the Naval Air Material Center, Friday, May 19. The pilots are ejected during indoctrination to simulate emergency escape from high speed aircraft.

MEDICINE

Colitis Yields to Chloromycetin

➤ MARKED or moderate improvement in two-thirds of a group of patients with ulcerative colitis has been achieved by treatment with chloromycetin, one of the antibiotic wonder drugs, Dr. Z. T. Bercovitz of New York reported to the Medical Society of the State of New York.

Only one-third of the patients failed to show a favorable change in their condition.

Those who improved began to get better within the first month. Of the 13 markedly improved patients, nine have remained completely well, or in "complete remissions" s Dr. Bercovitz phrased it, for periods of more than a year.

In some cases there were relapses but they were mild and the patients promptly got better when chloromycetin was started again. No patient ever relapsed to as severe a state of illness as before the mold drug treatment.

At least five years must elapse, however, Dr. Bercovitz said, before final conclusions on the results of treatment can be drawn. This period is needed to allow for evaluation of chloromycetin and also the many other conditions which may affect this disease.

Science News Letter, May 20, 1950

MEDICINE

Rubberized Forceps Make Childbirth Safer

➤ RUBBERIZED forceps blades for preventing injury to the new baby's skull when forceps must be used to assist in the birth were shown by Dr. Emanuel M. Greenberg of Beth Israel Hospital, New York, at the meeting in New York of the Medical Society of the State of New York.

The blades were rubberized by dipping in liquid latex until a thin coating had been applied.

Science News Letter, May 20, 1950

AGRICULTURE

Vertical Stacks Replace Smudge Pots in Orchards

➤ SMUDGE pots to warm orchards, protecting them from frost, can be replaced by vertical stacks through which air circulates from top to bottom.

Usually when smudge pots are used, the air 100 to 200 feet above the ground is about nine to 18 degrees Fahrenheit warmer than the temperature near the ground.

Dr. Robert G. Fleagle of the University of Washington has calculated that the energy required to operate fans to force this warm, upper air down a vertical stack is much less than that needed to heat up air near the ground to the same temperature.

He further found that when only a small quantity of warm air is required, no power would be needed to turn a fan at the top of the stack. The energy of the wind itself would do the job. If, however, the wind is at high speed, there is no need for the stack since any higher warm air would then be sufficiently circulated.

The advantages claimed for the stack method of warming crops include greater uniformity of temperature, absence of smoke, gas and dirt, less attention required and the possibility of using the wind itself for power.

Science News Letter, May 20, 1950

VETERINARY MEDICINE

Call the Vet if Rover Looks Yellow

➤ IF Rover begins to look a little yellowish, he needs a vet. Severe and chronic kidney trouble in dogs is now known to be preceded by a jaundice-producing infection called leptospirosis, Dr. Gerry B. Schelle of Boston told the American Animal Hospital Association's annual convention in Denver.

The disease has spread to thousands of U.S. dogs, Dr. Schelle said. Interfering with the function of liver and kidneys, it disables and then kills if affected animals are not treated promptly.

Acute nephritis—a severe inflammation of the kidneys—comes in the early stages of leptospirosis. Unless wiped out quickly, it can affect the dog for the rest of its life.

The antibiotic drugs streptomycin and aureomycin are being used by veterinarians to cure leptospirosis.

Science News Letter, May 20, 1950

MEDICINE

Mustard Gas Helps Kidney Patients

➤ NITROGEN mustard of war gas fame may prove helpful for treating one type of kidney disease, known as glomerulonephritis.

Striking improvement after this treatment in three out of eight patients was reported by Drs. Herbert Chasis, William Goldring and David S. Baldwin of New York at the meeting of the American Society for Clinical Investigation.

Of the other five patients, two died and three are still under treatment.

The improvement in the first three has persisted for seven months, eight months and one month. The patients had been sick for from five months to almost three years, in one case.

Temporary return of the glomerular (filtration) function of the kidneys toward normal was induced by the nitrogen mustard treatment, various tests showed. After these temporary changes had been repeatedly brought on by several courses of treatment, improvement in function persisted.

Science News Letter, May 20, 1950

IN SCIENCE

AGRICULTURE

New Spray Brings Rosy Cheeks to Apples

➤ ROSY cheeks for apples?

Science says "yes." There is a method just discovered by Cornell's Agricultural Experiment Station. It has not yet been developed commercially.

The new spray has a long name—sodium diethyldithiocarbamate. It in itself doesn't add the color; the red pigment in the apple still does that. The spray merely increases the production of this pigment, anthocyanin.

Dr. Masami Uota, now employed by the U. S. Department of Agriculture in Wenatchee, Wash., found that spray-treated apples had about 40% more color than untreated ones. And the red color was more intense on treated fruit, adding to its attractiveness. Occasionally there was some injury to foliage and fruit. Further details and a commercially acceptable spray remain to be worked out.

Science News Letter, May 20, 1950

CHEMISTRY

Ether Blends with Fuels Promote Anti-Knocking

➤ THE best type of ether to use in fuels for airplane engines to eliminate knock is what chemists call methyl tert-butyl ether, the Lewis Flight Propulsion Laboratory states in a new report.

This laboratory is a research institution maintained by the National Advisory Committee for Aeronautics, a government agency with headquarters at Washington, D. C. Its primary job is the study of all types of airplane propulsion and all types of fuels for the purpose.

From studies of 23 ethers, each blended with base fuels, methyl tert-butyl appears to have the best anti-knock effectiveness, the report says. It is an organic chemical, the "tert" standing for tertiary.

In general, according to the report of I. L. Drell and J. R. Branstetter of the laboratory staff, tert-butyl alkyl ethers gave the highest blend knock ratings, followed by aromatic alkyl ethers and others.

The low knock limit of "ether" (diethyl ether) has long been known and has been studied for the past two decades. During World War II, knock studies of methyl tert-butyl ether were made but the results were not published. The results of German studies, however, have been published.

The NACA investigation had to do with a systematic program of research on ethers deemed worthy of further study. The report gives information relative to the ethers and fuels used and the knock ratings obtained.

Science News Letter, May 20, 1950

NCE FIELDS

MEDICINE

Hodgkin's Disease Itch Relieved by Cell Acid

➤ THE itching which often tortures victims of Hodgkin's disease can be relieved, at least temporarily, in half the cases by a chemical called adenylic acid, scientists at St. Vincent's Hospital in New York have discovered.

Adenylic acid is a breakdown product of cell chemistry and is one of the factors in the vitamin B complex. Trials of the effects of other products of body chemistry are now under way, reports the American Cancer Society which supports the research.

Science News Letter, May 20, 1950

PLANT PATHOLOGY

U. S. Keeps Philippines From Coming to Rope's End

➤ A U. S. specialist on tropical plant diseases is in the Philippines to keep the islands, figuratively speaking, from coming to the end of their rope.

He is Dr. Otto A. Reinking, Cornell University professor who is on a special mission as a technical adviser to the Philippine Government from the U. S. Department of Agriculture.

The enemy he was sent to combat is a disease attacking the manila hemp plant, abaca, which provides the raw material for the best marine rope in the world. Called the mosaic disease, it has hindered the recovery of the hemp industry from the beating it took in World War II.

Dr. Reinking and his wife, who is also a plant pathologist, will aid Philippine scientists in their fight against other island diseases. One is called cadang-cadang. A coconut disease, it is causing serious losses to this important Philippine export crop.

Science News Letter, May 20, 1950

ENGINEERING

Sun Supplied 75% Heat Needed for Solar House

➤ DIRECT sunlight supplied three-fourths of the heat needed to keep an occupied experimental solar-house comfortable during the past winter, it was revealed by the Massachusetts Institute of Technology.

The building is a five-room house erected in Cambridge, Mass., to study solar heating and to determine how far direct sunlight can be used for heating in New England instead of ordinary fuels. As a result of the test, staff members of the institute stated that a house heated 90% by the sun's rays will be possible without excessive construction costs.

In appearance the house is a typical modern-style residence except for its heat collector on the roof. Water is used to store the heat of sunshiny days for nights and cloudy conditions. It is warmed by a special flat collector on the roof.

The water warmed by the collector is pumped into an insulated tank, and from there, when needed, through pipes in ceilings. Heat is radiated to the rooms by standard radiant heating panels. Supplementary heat when required is electrical.

The roof heat collector unit slopes 57 degrees to the horizontal, faces south and presents a net area of 400 square feet to the sun. The rest of the roof is aluminum so that additional solar heat reaches the collector by reflection.

The collection and heating unit is a compact, closed-cycle system at atmospheric pressure. The parts of the unit include the roof collectors, an attic storage tank, a radiant ceiling panel heater, two circulating pumps and controls. Thermostats control automatically water circulation to the panels.

This M.I.T. solar house was built by funds provided by Dr. Godfrey L. Cabot of Boston. The solar heating studies are directed by L. B. Anderson, architect, H. C. Hottel, chemist, A. G. H. Dietz, building engineer, A. L. Hesselschwerdt, Jr., professors on the institute's staff.

Science News Letter, May 20, 1950

DENTISTRY

Value Of Ammoniated Powders Questioned

➤ AMMONIATED tooth powders and mouth washes, widely advertised in the United States as helping prevent tooth decay, will not accomplish this purpose, in the opinion of three British scientists.

The use of ammoniated dentifrices is based on the observation of some American scientists that persons who are naturally free from tooth decay have the kind of saliva which is capable of producing more ammonia under certain conditions than have persons susceptible to tooth decay.

Drs. G. Neil Jenkins, Donald E. Wright and T. K. Miller, physiologists and bacteriologist of King's College Medical School at Newcastle-upon-Tyne, have repeated the American experiments and find no difference between the behavior of salivas from persons with different rates of tooth decay.

If keeping the mouth alkaline instead of acid should prove effective in reducing or preventing tooth decay, dibasic sodium phosphate would be as good as dibasic ammonium phosphate, Dr. Jenkins and colleagues also found.

Detailed findings have not yet been issued by the Newcastle scientists although a preliminary note has been published in the British science journal, NATURE (April 15).

Science News Letter, May 20, 1950

STATISTICS

Death Rate for Married Women Halved in 50 Years

➤ THE death rate for married women over age 20 has been cut in half during the past half century. For those at ages 20 to 24 the rate dropped nearly 90% between 1900 and 1948.

Death rate figures for married men also show a reduction since 1900 but the decline was less than one-third, statisticians of the Metropolitan Life Insurance Company in New York report.

The death rate for unmarried women over age 20 dropped two-fifths between 1900 and 1948. Unmarried men had the same one-third drop in death rate as the married men.

The reduced toll from maternity accounts to a large extent for the big reduction in death rate for married women. This results partly from the long-term decline in the birth rate and partly from marked progress in safeguarding mothers during pregnancy and childbirth.

Science News Letter, May 20, 1950

MEDICINE

Medicine Injected by New Automatic Syringe

➤ SHOTS of medicines can now be given by an electrically controlled automatic syringe developed by Dr. George B. Jerzy Glass of New York Medical College.

From a few drops (5 cc) to about three ounces can be given at a precise rate of speed ranging from a few minutes to several hours and maintained at a fixed rate, he told the Medical Society of the State of New York meeting in New York.

The instrument can be used for a wide range of procedures including local and other kinds of anesthesia and slow injection of drugs when desirable.

Science News Letter, May 20, 1950

MATHEMATICS

To Run in Rain To Get Less Wet Is Correct

➤ YOUR intuition is right—run in the rain and you will get less wet. A mathematical study has now proved the soundness of this intuitive advice.

Dr. Jack W. Rizika of the Massachusetts Institute of Technology has satisfied a small part of human curiosity by his analysis of the proper speed you should take to get the least wet when it is raining and you want to go from one place to another. Without an umbrella, that is.

If you could run fast enough, you wouldn't get wet at all! To do this, however, you would have to have a velocity approaching infinity.

Science News Letter, May 20, 1950

MINING

Low-Grade Ore Yields Iron

Taconite is a plentiful, low-grade ore which is difficult to mine. Jet-flame drills, by making mining easier, may make taconite a new U. S. resource.

By ANN EWING

➤ THE danger of the end of the "Iron Age" in America due to the lack of high-grade iron ore can be averted.

A way has been discovered to turn vast quantities of low-grade ore available in this country into satisfactory material for the iron and steel industry.

A Second Mesabi

Taconite is the name for the low-grade extremely hard iron ores found in almost unlimited supply. Taconite promises a second Mesabi, for these ores are abundant in the same district from which our high-grade supplies have been coming.

Iron is found in the earth's crust in extremely large quantities, approximately 5% of the entire earth's surface consisting of this vital element. Recent figures indicate that the world has billions of tons of actual and potential iron ore, but much of this is low-grade and inaccessible.

In addition to the vast deposits of the Lake Superior region, large iron ore beds occur in South America, Africa, India, Russia, Sweden and Canada. Recently the rich deposits of Labrador and the so-called "mountain of iron" in Venezuela have received much attention.

Delivery of high quality Labrador ore to a St. Lawrence River port involves 400 to 500 miles of overland rail shipping. Without the St. Lawrence Seaway, it is doubtful if this ore could compete commercially with other foreign ores or with taconite ores after concentration.

An Iron Mountain

The Venezuelan iron ore deposits are rich and extensive. Cerro Bolivar, as the recently discovered iron mountain is known, contains more tonnage of iron than the largest open pit in the Mesabi Range ever produced or ever will produce.

Shipment of these or other high-grade foreign ores to the blast furnaces and steel mills in this country during an emergency might leave the ore-laden boats open to submarine attack, however.

Our supplies of top-grade rich-in-iron ore, the stuff that can be dug and shipped for blast furnace use without further treatment, are being used up rapidly. Two world wars took great hunks out of the reserves of the Mesabi region. And there is slim, if any, chance that new deposits of high-grade ore will be found in the Lake Superior district.

But the hundreds of millions of tons of taconite that surround the now almost exhausted rich iron pocket of the Mesabi Range can be the domestic ore supply of the future.

Taconite is so hard that it is extremely difficult to mine. This has delayed its use. But now, a promising aid in the development of taconite has been perfected—a jet flame that pierces this solid rock at an unprecedented rate.

Where previously a churn drill could bite through only about one foot of taconite per hour, the jet-flame drills will burn a nine-inch diameter hole at the rate of 20 to 30 feet an hour.

Jet-piercing works on the same principle as that which propels rockets. Instead of thrust propulsion, however, use is made of the flame itself and the speed of the flame. Oxygen and a fuel such as kerosene are burned in a specially designed chamber to give the violent combustion.

High-Temperature Jet

Temperature of the flame that pierces this tough rock is probably over 4000 degrees Fahrenheit, yet the ore does not melt. It does not even fuse. The jet flame just disintegrates a hole in the solid rock. When a series of holes have been jet-burned in this manner, they are filled with explosive and blasted. Thus can taconite be mined.

The rock itself contains about 40% iron. Of this, about 25% to 30% is magnetic and can be recovered without too much difficulty after the ore is ground fine and concentrated.

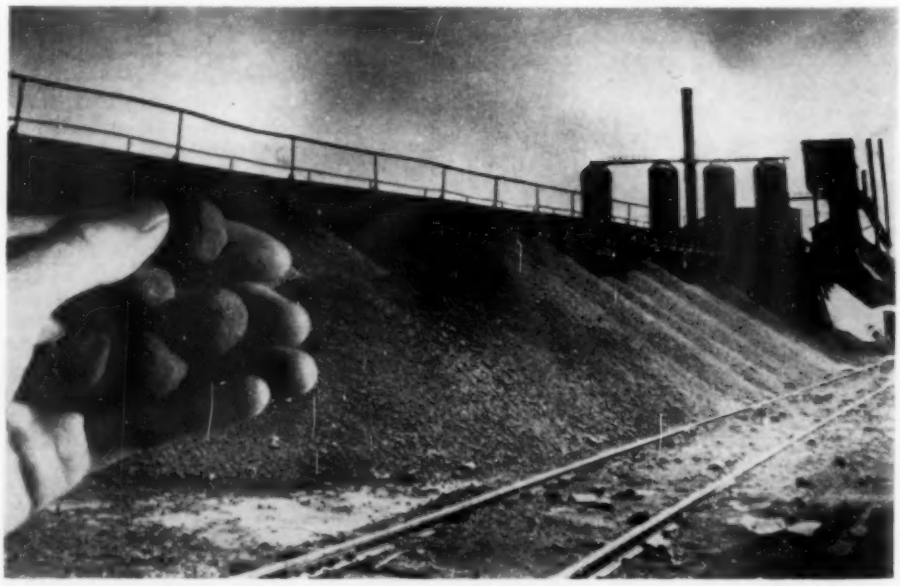
Engineers have worked out on pilot-plant scale methods that can make these magnetic taconites commercially competitive with the high-grade direct-shipping ores now being dug.

Taconite is much more abrasive and harder than granite. The hardest crushers yet made in the United States have been developed to crush taconite to the proper fineness.

Crushing is done in successive stages, until the rock is reduced to about ¾ inch size. Then the stone chunks are put into a rod mill. This is a big drum containing steel rods. As the drum revolves, the rods fall and grind the ore. In this manner the rock is ground to the same fineness as face powder. Or until about 85% of the material will pass through a screen having 105,000 openings to the square inch.

By passing this fine powder between magnets, it is concentrated to the point where it contains at least 63% metallic iron. This fine, powdery concentrate must then be put back into a form that is suitable for shipping and for blast furnace use.

There are three methods of processing that have been tried: sintering, briquetting and pelletizing, which transform the taconite powder, respectively, into irregular lumps, brick-like blocks, or small round



ORE OF TOMORROW—A stockpile of our domestic iron ore of the future is shown. Taconite, as in the pellet form above, can be concentrated and substituted for the rich Mesabi ore that has kept our industrial pot boiling for years.

INDUSTRIAL NOCTURNE — Taconite-concentrate pellets can be used to feed the ravenous appetites of the hungry blast furnaces. Never satiated, knowing no night and day, their giant maws are ever open for more ore to transmute into iron.

balls. Of these, pelletizing promises to be the least expensive method.

Because of their uniform size, pellets are easily fed into the blast furnace. And engineers now believe that pilot plants have demonstrated that pelletizing can be done on a large-scale, mass production basis without difficulty.

In order to make pellets, the magnetic concentrate is dampened. In a huge revolving drum, this damp powder is rolled up into small balls about the size of large marbles.

These iron marbles are then heated in a furnace at an even temperature. If the furnace is allowed to become too hot, mass fusion instead of pelletizing takes place. Careful temperature control, therefore, is required.

The pellets must be porous in order that the blast furnace gases will attack and melt the iron they contain. They also have to be hard enough to withstand the rough treatment they receive during shipment to the ore boats, in the boats going down the Great Lakes and in the stockpiles awaiting use.

It takes three tons of crude rock to produce one ton of taconite concentrate. The material thrown away is known as tailings. Gray in color, tailings are almost pure sand or silica.

Because of the huge amounts of taconite that will have to be concentrated to keep the iron and steel industry going at the present or an increased rate, the disposal of tailings presents a problem. They could be dumped on the ground, but it would take vast areas to accommodate them.

Or they could be put into Lake Superior. If this is done, it is believed that the sand thus added to the lake will be helpful for the spawning of fish.

The huge grinding, separating and agglomerating operation for making taconite-concentrate pellets will require enormous quantities of water, electric power and fuel. Forty-eight tons of water must be pumped for each ton of iron concentrate produced. An adequate water supply, therefore, is a major necessity.

Adequate Financing Needed

Building of the full-scale plants now awaits only adequate financing. Plans that would eventually bring taconite production to 30,000,000 tons a year would require some kind of government help. Since it would take about four years to build a plant with a capacity of 2,500,000 tons, many persons are anxious to see a start made on this project at the earliest possible date.

Even for such a relatively small production of taconite concentrate, the initial investment has been estimated at $15,000,000 to $20,000,000 for the processing plant and accessory equipment.

Development of large scale production of taconite is essential if we are to avoid complete dependence on foreign sources for our iron ore. Although the time factor to complete exhaustion varies with different estimates, both government officials and private industry agree that the high-grade iron ores are being depleted, and that the chances of finding new high-grade resources are fairly remote.

We must, therefore, have some domestic source that can keep our vast steel industry going, especially in an emergency period. Taconite, many people claim, is the only answer.

Send 50c to Science Service, 1719 N Street, N. W., Washington 6, D. C., for the Iron Ore Unit of Things of Science telling more about taconite.

Science News Letter, May 20, 1950

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M 222

PHYSICS

Detector Identifies Atoms

➤ A NEW and extremely sensitive instrument for detecting and measuring radioactivity has been developed by physicists of the University of Manitoba in Winnipeg.

It goes the Geiger counter one better by not only showing the presence of radioactive material but also telling which radioactive material is present.

Called a gamma ray spectrometer, it already has uncovered previously unknown deposits of uranium in northern Saskatchewan. In addition, it has been used in airplanes for high-speed airborne radioactive prospecting, report the men who constructed the device.

Physicists Robert W. Pringle, Kenneth I. Roulston and Harry W. Taylor describe this new use of the basic "scintillation counter" in the REVIEW OF SCIENTIFIC INSTRUMENTS (March) published by the American Institute of Physics.

Working on a principle different from that of the famed, widely-used Geiger counter, the spectrometer can actually identify tiny amounts of radioactive elements from the gamma rays they constantly send out. The Geiger counter can only show that a radioactive material is present.

Such a spectrometer is similar to those astronomers use in learning the composition of the sun and stars and to the infra-red spectrometers by which industry can check the exact chemical composition of complex organic substances.

The new type for gamma rays employs a crystal of sodium iodide activated by a tiny amount of a radioactive iodine salt.

In a second report in the British journal, NATURE (April 1), the Canadian scientists say portable detectors built on this principle were operated "with considerable success" in a search for uranium in northern Canada last summer.

"It was found possible to detect substantial deposits of uranium ore at distances of several hundred feet," they report.

The detectors, employing tiny electronic parts from ordinary hearing aids, weighed only eight pounds each.

"The ultimate significance in civil defense of extremely sensitive detectors of the type we have been using is not difficult to appreciate," the scientists predict.

Science News Letter, May 20, 1950

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GENERAL SCIENCE

Scientists Among U. S. Delegation to UNESCO

➤ A NOBELIST in physics, a university president-psychologist, a deputy assistant secretary of state, a school teacher and an educational leader are the five official U.S. delegates to the UNESCO annual conference at Florence, Italy, beginning May 22.

They are Dr. I. I. Rabi of Columbia University, Dr. George D. Stoddard of the University of Illinois, Howland H. Sargeant, Miss Bernice Baxter of Oakland, Calif., and Dr. George F. Zook of the American Council on Education, Washington.

Among the advisers to the delegation is Dr. E. C. Stakman of the University of Minnesota, botanist whose work has resulted in disease-resistant wheats.

Science News Letter, May 20, 1950

GEOPHYSICS

Jog-Log Helps Ships Zig When Ocean Zags

➤ A NEW shipboard instrument called a "jog-log" will help the seagoing navigator follow a true course through ocean currents trying to push him where he does not want to go.

Its accuracy in measuring the speed of surface currents has been proved in ocean trials, William S. von Arx of the famed Woods Hole Oceanographic Institution reported at the annual meeting of the American Geophysical Union.

The new device, technically known as a geomagnetic electrokinetograph, uses the magnetic force in the earth which swings the compass needle. Its operation is based on the century-old law of magnetic induction: a wire moved through a magnetic field generates an electric current.

The "jog-log" measures the electrical charge in a length of wire trailed behind an ocean vessel. The ship using it follows a zig-zag course for a time, hence the name "jog-log."

More accurate prediction of where an iceberg will drift as it nears shipping lanes, or where searchers should look for a lost life raft, will be valuable results of data secured by oceanographers with the new device.

The instrument was developed as part of a research program at the Woods Hole Oceanographic Institution for the U.S. Navy.

Science News Letter, May 20, 1950

Seniors of 1951

➤ WITH summer vacation ahead, many high school students will start work on scientific projects which will be part of their entry in the Tenth Annual Science Talent Search.

The project can consist of a study in any field of interest for which equipment is available. An excellent project was done on "the physics of the ping-pong ball," and a small section of a potato patch was sufficient for a study of the effects of different insecticides on potato beetles.

With the whole field of science to choose from, choice of a project may puzzle many seniors. The titles of project-reports written by the 40 winners in the Ninth Annual Science Talent Search may offer helpful suggestions:

Preliminary Investigations of Some Common Vegetable Substances Through Chromomatographic Adsorption Analysis—Comments on the Theory of Relativity—Design and Construction of a Scintillation Counter—Construction of a Machine to Play Tick-Tack-Toe—A Study of Binding Energy and Nuclear Reactions—Making and Using My Six-Inch Telescope—Radiation Characteristics of Antennas at Ultra-High Frequencies—Gaseous Conduction—Selenium: A Study of Its Compounds and Their Physiological Effect Upon Plants—One Summer's Survey of Shallow-Water Fishes at Coney Island, N. Y.—A Contribution to Atomic Education—Solution of Alternative Pathway Mazes by Ants—Census of Breeding Birds—Report on the Effect of Comic Books on the Reading Habits of Elementary School Children—The Design and Construction of an Audio Amplifier—Research in Plane Curve Theory—The Odd Nucleon Effect—Experiences with Science—Ideal Concentration for the Zn-H_2SO_4 Reaction in Elementary Chemistry Laboratory Experiments—Plant Galls—Alkalinity Correction in Soils of the Southwest—Metallurgy and Me—A Three-Dimensional Periodic Table—A Qualitative Scheme for the Identification of the Halogens—Researches in Protozoology—The Life History and Control of the Colorado Potato Beetle—Changes in the Kidneys and Hearts of Rats with Chronic Experimental Hypertension and Their Treatment by Dietotherapy—Visual Detection of Alpha Particles—Solving Equations of the Third Degree and Higher—The Effects of Light on Ascorbic Acid—Track-Length Measurements in Nuclear Research Emulsions—Chromium Pentoxide and Perchromic Acid—The Effects of Radiation on Drosophila Melanogaster—Introductory Research in Astrophysics—Differential Staining of Bacteria—The Chemiluminescence of 3-Aminophthalhydrazide—A Preliminary Investigation Toward the Description of Three Possibly New Species of Bacteria—Building a Magnetometer—Theory of Arithmetical Operations—The Theory and Construction of an Inexpensive Neutron Source of Moderate Strength.

Information on how to start a project and write the report will be sent free of charge if you request details of the Tenth Annual Science Talent Search from Science Clubs of America, 1719 N St. N.W., Washington 6, D. C.

Science News Letter, May 20, 1950

SENIORS OF 1951

Start Now on YOUR SCIENTIFIC PROJECT

TO WIN in the *Tenth* ANNUAL

Science Talent Search

Conducted by SCIENCE CLUBS OF AMERICA, a SCIENCE SERVICE activity and sponsored by the WESTINGHOUSE EDUCATIONAL FOUNDATION, an organization endowed by the WESTINGHOUSE ELECTRIC CORPORATION for the purpose of promoting education and science.

You have a chance to share in ELEVEN THOUSAND DOLLARS

in WESTINGHOUSE SCIENCE SCHOLARSHIPS AND WIN TRIPS TO WASHINGTON

WRITE A REPORT of about 1,000 words on the subject, "MY SCIENTIFIC PROJECT." Your report should tell what you are doing or plan to do in science in the way of experimentation or other research activity. It should be original and creative in character. Now, before the school year ends, is the time for high school seniors of 1951 to get started on science projects. With an early start you can plan a project, carry it through more carefully, write a better report on it. Next December take an examination which tests your ability rather than your fund of information. Supply your school with information about yourself to be sent in with your report and examination papers.

Do these three things and you may be among the forty boys and girls who will win all-expense trips to the Science Talent Institute and compete for scholarships for the continuation of your education. Of the forty, one will be selected as winner of the $2,800 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIP; another as winner of the $2,000 WESTINGHOUSE GRAND SCIENCE SCHOLARSHIP; eight more of the forty boys and girls will be selected to receive WESTINGHOUSE SCHOLARSHIPS OF $400 each; and $3,000 more in WESTINGHOUSE SCHOLARSHIPS will be awarded at the discretion of the judges. Every one of the forty boys and girls will, when in Washington, be awarded the GOLD EMBLEM OF SCIENCE CLUBS OF AMERICA.

Start your project NOW

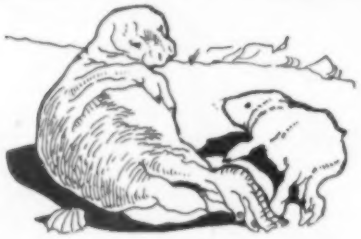
1. Pick a subject that you can investigate at first-hand, preferably one about which you can do more than just read. Typical projects of Science Talent Search winners have been in such fields as Aeronautics, Agriculture, Astronomy, Botany, Chemistry, Electronics, Geology, Mathematics, Meteorology, Medical Sciences, Nutrition, Photography, Physics, Psychology, Radio, and Zoology.
2. Whatever your project may be—read about it. Learn what has already been done. It is often desirable to repeat previous experiments, but it should be done deliberately and for a purpose.
3. Write what you did, not merely what you read. Tell it in simple language; follow it through step by step. Then tell what you observed as a result of your experiments, and what conclusions you draw from these observations.
4. Fancy writing has no place in science. There has been great writing in the sciences but it is the greatness of strength and simplicity.

SEE YOUR SCIENCE TEACHER

or write SCIENCE CLUBS OF AMERICA, 1719 N Street, N. W., Washington 6, D. C.

WILDLIFE

NATURE RAMBLINGS



Seal

➤ CONSIDER the happy life of the papa seal in the spring. When the seals swim north in the Pacific Ocean to their rookeries in the Pribilof Islands in the Bering Sea, the males fight it out for possession of all the females they can lay their flippers on.

The bigger and stronger ones build up their harems, and the young "bachelors" are forced off to live by themselves. That hurts, because seals are among the most highly polygamous animals in existence.

It hurts even more when the fur hunters begin taking their harvest. These surplus males can be killed without fear of interfering materially in the normal life of the herd. About 3,000,000 fur seals gather in the Pribilofs yearly to breed. The herds have been protected and managed by the U. S. Fish and Wildlife Service since they nearly became extinct in the early years of the century. In 1910 their numbers reached a low of 132,000.

When the young seal pups are born, the job of teaching them to swim is left to the mother. Pop would be swamped if he had to instruct all his offspring. Yet the pups have to be taught, in much the same way that young birds are pushed out of the nest to fly, before the family can go south again for the winter.

Even though the seal pup is destined to spend the greater part of his life in the sea, he is not a born swimmer. As a matter of fact, at first he hates the water and has to be coaxed into it.

The mother seal's method of teaching her youngsters is very much like that followed by human parents with recalcitrant offspring. She persuades the pup to climb onto her back, and swims out into the water with it. She gives the youngster time to become accustomed to the strange watery surroundings.

Then she slips out from under, leaving the pup to flounder back to land. The young seal never fails to make the shore, and in the end always becomes an expert swimmer.

Once in a great while, in wintertime storms at sea, the pup's new skill is not enough. That happened this year off the coast of Oregon and Washington. Hundreds of fur seal pups fought desperately and then died in churning seas that accompanied violent 90-mile-an-hour January gales. They were washed up on the shoreline, where Wildlife Service biologists found among the dead a few of the 20,000 pups which were tagged last summer in the Pribilofs.

They know that thousands more survived the storms. They are on their way back now to the Bering Sea. The old males have courting to do.

Science News Letter, May 20, 1950

CATARACT SUFFERERS

New light magnifiers now available help people with cataract conditions to read and write more easily and comfortably at night. Two models: 1. LEK-TRO-LENS light magnifier clips on 25 to 100 watt bulbs in lamps, light fixtures, focuses twice the light. Swings to any position. Postpaid. 2 for $1.00 plus 6¢ stamps. 2. DAY-BRITE magnifier is like LEK-TRO-LENS but has filter, gives WHITE LIGHT similar to daylight. 79¢ each —2 for $1.58, Postpaid.

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MEDICINE

Penicillin Treatment Prevents Rheumatic Fever

➤ ACUTE rheumatic fever, which attacks some quarter of a million persons in the United States annually, can be prevented by penicillin treatment of streptococcic disease or, in lay terms, strep. sore throat.

An Armed Forces study showing this is reported by a team of three Army and two civilian physicians in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (May 13).

The study was made at Fort Francis E. Warren in southeastern Wyoming. This is an Air Force technical training base. All patients admitted to the hospital there with colds, sore throats or any disease of the respiratory tract during a six-month period were seen, within a few hours after hospital admission, by one of the professional staff of the laboratory. Those having exudate, or so-called spots, on tonsils or throat were included in the study.

Of 798 who were then given penicillin, only two developed rheumatic fever, follow-up study three to four weeks later showed. In contrast, in a group of 804 patients with similar strep. sore throats who did not get penicillin, 17 developed acute rheumatic fever. This difference could be due to chance only six times in 10,000. The study was conducted by Capt. Floyd W. Denny, Capt. Lewis W. Wannamaker, Capt. William R. Brink of the Army and Dr. Charles H. Rammelkamp, Jr., of Western Reserve University School of Medicine, Cleveland, and Dr. Edward A. Custer of Palo Alto, Calif.

Science News Letter, May 20, 1950

AGRICULTURE

One Type of Grass May Remain Green All Year

➤ TAKE heart, you amateur gardeners, a type of turf grass that stays green the year around is on the way. It is being tested in several parts of the United States right now.

It is a type of Bermuda grass known as "U-3." "This new strain is a tame version of the well-known 'devil grass,'" explained Dr. Charles K. Hallowell, on leave from Pennsylvania State College and now at the University of California at Los Angeles. "It stays green most of the year in many regions and in those where there is little or no frost gives promise of doing so the year around."

At the present time, it is possible to maintain a green lawn the year around by combining several types of grasses. But this is costly—both the initial investment and the upkeep.

Dr. Hallowell is working in the experimental turf culture program at U.C.L.A., the aim of which is to improve lawns, not only around the home, but in parks, golf courses, cemeteries and other public places.

Science News Letter, May 20, 1950

• Books of the Week •

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

THE ACTINOMYCETES: Their Nature, Occurrence, Activities, and Importance—Selman A. Waksman—*Chronica Botanica*, 230 p., illus., $5.00. A monograph on the biology of actinomycetes which yield antibiotics.

THE ADVANCED ATLAS OF MODERN GEOGRAPHY—John Bartholomew—*McGraw-Hill*, approx. 155 p., illus., $8.50. Latest available geographical data. Excellent color plates.

THE DOUGLAS-FIR BEETLE—W. D. Bedard—*Gov't Printing Office*, U. S. Dept. of Ag. Circ. No. 817, 10 p., illus., paper, 10 cents. A short study of the most destructive insect-enemy of douglas-fir.

FARM-TO-RETAIL MARGINS FOR MARKETING WESTERN TURKEYS—Bureau of Agricultural Economics—*Gov't. Printing Office*, U. S. Dept. of Ag. Information Bull. No. 5, 12 p., illus., paper, 10 cents.

FOOD FOR LITTLE PEOPLE—Hazel Kepler and Elizabeth Hessler—*Funk & Wagnalls*, 276 p., illus., $3.75. Presents the psychological as well as the nutritional aspects of feeding the pre-school child.

FUNDAMENTALS IN CHEMISTRY FOR THE LABORATORY—W. Conard Fernelius, Alferd Benjamin Garrett and Laurence Larkin Quill—*Ginn*, rev. ed., 366 p., illus., paper, 75 cents. A laboratory manual for the introductory course in chemistry.

HANDBOOK OF AERIAL MAPPING AND PHOTOGRAMMETRY—Lyle G. Trorey—*Cambridge University Press*, 178 p., illus., $5.00. A manual for making maps from air photographs.

LABORATORY MANUAL OF BIOCHEMISTRY—Benjamin Harrow and others—*Saunders*, 3rd ed., 149 p., illus., paper, $2.25. A laboratory manual designed to go with Harrow's TEXTBOOK OF BIOCHEMISTRY listed elsewhere in this column.

LECTURES ON GENETICS, CANCER, GROWTH, AND SOCIAL BEHAVIOR: Roscoe B. Jackson Memorial Laboratory Twentieth Commemoration 1949—W. E. Heston and others—*Roscoe B. Jackson Memorial Laboratory*, 124 p., illus., paper, $1.00. Several special lectures given in honor of Dr. C. C. Little, the director of the laboratory since its founding.

MOLECULES IN MOTION—T. G. Cowling—*Hutchinson's University Library* (U. S. Distributor: *Longmans, Green*), 183 p., illus., $1.60. An account of gas theory with its historical background.

PROCEEDINGS OF THE FIRST NATIONAL AIR POLLUTION SYMPOSIUM—*Stanford Research Institute and others*, 149 p., illus., paper, $2.50. Discussions of the nature and cause of air pollution, its effects and correction. The symposium was held Nov. 10-11, 1949.

REPORT OF THE COMMITTEE ON A TREATISE ON MARINE ECOLOGY AND PALEOECOLOGY 1948-1949—Harry S. Ladd, Chairman—*National Research Council*, 121 p., illus., paper, $1.00. A report presented in preliminary form before the Division of Geology and Geography of the National Research Council, April 23, 1949.

ROLE OF FUNGI IN THE HEATING OF MOIST WHEAT—Edward P. Carter and George Y. Young—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 838, 26 p., illus., paper, 10 cents.

SAFETY AND HYGIENE IN THE CHEMICAL INDUSTRIES, Rep. No. II: Chemical Industries Committee—*International Labor Office*, 84 p., illus., paper, 50 cents. A report presented before the International Labor Organization, Geneva, Switzerland, Feb.-Mar., 1949.

SEXUAL BEHAVIOR: How Shall We Define and Motivate What is Acceptable?—Frank J. Hertel and others—*American Social Hygiene Association*, 32 p., paper, 25 cents. Papers and notes from a panel discussion before the American Social Hygiene Association, February 1, 1950.

A SOURCE LIST OF SELECTED LABOR STATISTICS—*Special Libraries Association*, rev. ed., 67 p., paper, $1.75. A compilation of publications having to do chiefly with wages, hours and employment.

THE STORY OF OUR TIMES: Encyclopedia Yearbook 1950—E. V. McLoughlin, Editor-in-Chief—*Grolier Society*, 432 p., illus., $10.00. Provides a review of the year's developments as seen through the eyes of more than 100 authorities. "Science Highlights in 1949" and "Science Previews" are written by Watson Davis, Director of Science Service, and "Wetter Water Joins the Fire Brigade" is written by A. C. Monahan, Science Service Staff Writer.

SUPERSONIC AERODYNAMICS: A Theoretical Introduction—Edward R. C. Miles—*McGraw-Hill*, 255 p., illus., $4.00. A text for senior and beginning graduate students in aeronautical engineering.

TEMPERATURES AND RELATED CONDITIONS IN WISCONSIN FARMHOUSES—J. Robert Dodge and M. J. LaRock—*Gov't. Printing Office*, U. S. Dept. of Ag. Tech. Bull. No. 1002, 81 p., illus., paper, 25 cents. A report of a study of the comfort and livability of the farmhouses of Wisconsin.

TEXTBOOK OF BIOCHEMISTRY—Benjamin Harrow—*Saunders*, 5th ed., 609 p., illus. $6.00. A college text brought up-to-date.

TIME AND ITS MYSTERIES: Series III—Henry Norris Russell, Adolph Knopf, James T. Shotwell and George P. Luckey—*New York University Press*, 126 p., $3.00. Four lectures given on the James Arthur Foundation on The Time Scale of the Universe, The Geologic Records of Time, Time and Historical Perspective and the Developments in Portable Timepieces.

THE USE OF CHEMICAL TESTS FOR ALCOHOL IN TRAFFIC LAW ENFORCEMENT—Glenn C. Forrester—*Thomas*, 91 p., illus., $2.00. A study of some of the problems that now exist and suggestions as to their solution.

YOU AND YOUR HEALTH—J. Roswell Gallagher—*Science Research Associates*, 48 p., illus., paper, 60 cents. Stresses the importance of correct information about health and discusses such problems as adolescent growth and development, diet, diseases and ways of protecting health.

Science News Letter, May 20, 1950

MEDICINE

Doctors Know How to Treat Most Atomic Bomb Injuries

➤ MOST of the injuries suffered during an atomic bomb attack are burns, broken bones and other types which doctors have been treating successfully for years, Dr. James C. Sargent stated.

Dr. Sargent, who is chairman of the American Medical Association's Council on National Emergency Medical Service, told a meeting called in Chicago by the Council that there is too much fear about the injurious effects of an atomic bomb compared with other bombs.

Dr. Sargent emphasized, however, that he feels communities and states which have not already launched civilian defense programs should start preparations immediately. In that way, he explained, supplies and doctors would be ready regardless of the type of attack.

Science News Letter, May 20, 1950

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⚙ *VINYL RESIN DOLL is rubber-like in appearance and approaches the human skin in touch. It has life-like facial expressions, detailed arms, fingers and toes, all due primarily to the accurate detail which can be obtained in molding processes using this plastic.*

Science News Letter, May 20, 1950

⚙ *ROTATING BRUSH, an improved type to attach to the end of the hose when washing cars or windows, adds a cleaning material to the water when desired or delivers untreated rinsing water. Operator flips a switch to add the detergent. A water-operated turbine in the device gives the rotating action.*

Science News Letter, May 20, 1950

⚙ *PORTABLE ADDRESSER, easily held in use by fingers and thumb of one hand, is designed to get mail addressed quickly and accurately by organizations with limited mailing lists. Master copy is typed on a spirit roll which holds 250 addresses and is easily inserted into the machine.*

Science News Letter, May 20, 1950

⚙ *FLAT IRON of the electrically heated type may be quickly converted into a hot plate for usual uses in a device recently awarded a patent by the government. Two hinged parts swing upward to form a handle for ironing but when in a level position form the hot plate.*

Science News Letter, May 20, 1950

⚙ *WATER-SOFTENER for the home, shown in the picture, is a simplified and less expensive type of the softener utilizing ion-exchange principles. It is connected into the water system, and is electrically operated. Hard water, released near the bottom, passes upward through a high-capacity bead resin to the household distributing piping.*

Science News Letter, May 20, 1950

⚙ *WATER-TIMER, for use on the lawn hose, automatically cuts the water off after a pre-set quantity has passed through it, thus preventing over-watering. It is a small device which is inserted between the outlet faucet and the hose. By the turn of a knob, "untimed" water is delivered.*

Science News Letter, May 20, 1950

⚙ *ORCHID GREENHOUSE for the window sill is made entirely of plastic and is eight inches long and six inches wide. It can be purchased with four potted hybrid orchid seedlings or is available empty for those who want to use it for African violets or other plants.*

Science News Letter, May 20, 1950

⚙ *CONTROL DEVICE protects water-cooled electrically operated equipment, such as air compressors and vacuum pumps, against damage through water failure. If the water supply fails, a weighted lever falls, opening the circuit. This stops the equipment or sounds an alarm.*

Science News Letter, May 20, 1950

⚙ *NICKEL-CLAD copper wire of very small diameter, suitable for use in high-temperature or corrosive atmospheres, is produced by automatic equipment which assures uniformity and quality. Good workability and electrical characteristics are assured through heat-treating and annealing processes.*

Science News Letter, May 20, 1950

Do You Know?

Yocco, an African jungle drink, cuts hunger and fatigue.

Straight *hairs* are somewhat circular in outline, while curly hairs are flattened.

Homes near high-tension electric power lines are apt to have much trouble with *radio reception;* a good antenna helps.

The *fertilizer* business in the United States had its real beginning in 1850 when the first commercial fertilizer mixture was manufactured in Baltimore.

Pentachlorophenol, a highly recommended substance for preserving wood, does not affect the appearances or natural odor of the wood impregnated with it.

Chemotherapy in plant culture means applying disease-killing chemicals in water to the soil in which plants are growing; the chemicals enter the plant by way of the roots.

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